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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Minoru Ito

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EXAMINER

YANG, JIE

ART UNIT

PAPER NUMBER

1733

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,660	Applicant(s) ITO ET AL.	
	Examiner JIE YANG	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim 5 has been cancelled; claims 1-4 pending in application. There is no amendment for the previous presented claims. claim 1 is an independent claim.

Status of the Previous Rejections

Previous objection of claims 2-4 under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim is withdrawn in view of the interview on 11/01/2010 and the Applicant's Remark marked 11/05/2010.

Previous rejection of claims 1-4 under 35 U.S.C. 103(a) as being unpatentable over Ito Minoru et al (JP 2003-313628 A, thereafter JP'628) is withdrawn in view of the interview on 11/01/2010 and the Applicant's Remark marked 11/05/2010. However, a new ground(s) of rejection is made (see below) in view of newly found reference, which makes this office action non-final.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito Minoru et al (JP 2003-313628 A, thereafter JP'628) in view of Yamamoto et al (US 5,421,920, thereafter US'920).

Regarding claim 1, JP'628 teaches a steel product having superior toughness in a HAZ (Heat-affected zone) (abstract of JP'628) with the vE_{-40} (J) measurement (Table 2 of JP'628) for thick plate application (Example in paragraph [0079] of JP'628), which read on the limitation of a high-strength thick steel plate excellent in low temperature toughness at heat affect zone result from large input welding as recited in the instant claim. The composition comparison between the alloy of JP'628 and the alloy of the instant invention is listed in the following table. All of the composition ranges disclosed by JP'628 (abstract, table 1, and claims 1-3 of JP'628) overlap the composition ranges as recited in the instant claim, which is a prima facie case of obviousness. SEE MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions of C, Si, Mn, P, S, Al, N, Ni, Ti, Nb, and Fe, and optionally adding Mg, REM, B, Cr, Mo, V, and Cu to the alloy of JP'628 because JP'628 discloses the same utility throughout the disclosed ranges.

Art Unit: 1733

Element	From instant Claim 1 (in wt%)	JP'628 (in wt%)	Overlapping range (in wt%)
C	0.03-0.14	0.03-0.18	0.03-0.14
Si	0.30 or less	0.5 or less	0.30 or less
Mn	0.8-2.0	0.4-2.0	0.8-2.0
P	0.02 or less	0.02 or less	0.02 or less
S	0.005 or less	0.02 or less	0.005 or less
Al	0.001-0.040	0.005-0.07	0.005-0.04
N	0.0010-0.0100	0.0005-0.007	0.001-0.007
Ni	0.8-4.0	0.6-4.0	0.8-4.0
Ti	0.005-0.030	0.005-0.03	0.005-0.03
Nb	0.003-0.040	0.005-0.10	0.005-0.04
Fe	Balance	Balance	Balance
	optionally		
At least one of	Mg: 0.0003-0.0050; REM: 0.001-0.030	Mg:0-0.0050; REM:0-0.100	Mg: 0.0003-0.0050; REM: 0.001-0.030
At least one of	B: 0.0005-0.0050; Cr:0.1-0.5; Mo:0.01-0.5; V:0.005-0.10; Cu:0.1-1.0	B: 0.0005-0.0030; Cr:0-0.6; Mo:0-0.6; V:0-0.1; Cu:0-1.0	B: 0.0005-0.0030; Cr:0.1-0.5; Mo:0.01-0.5; V:0.005-0.10; Cu:0.1-1.0

Still regarding claim 1, JP'628 teaches adding 0.0005-0.0050wt%Ca in the alloy, which is excluded by the instant invention by language of "consisting of" in the instant claim. However, Ca and REM are function equivalent elements in term of preventing UST defects in the steel alloy as evidenced by US'920. US'920 teaches a steel composition with the major compositions (Abstract and Col.6, line 38 to Col.8, line 65 of US'920) overlapping the composition ranges as recited in the instant invention. US'920 teaches that: "Ca and REM are added for the purpose of preventing UST defects and a reduction in the

Art Unit: 1733

toughness caused by the stretching of NLnS during hot rolling. They form Ca--O--S or REM--O--S, having a low high-temperature deformability, instead of MnS and can regulate the property and shape of inclusions as opposed to MnS. When Ca and REM are added in respective amounts exceeding 0.003% by weight and 0.01% by weight, Ca--O--S and REM--O--S are formed in large amounts and become coarse inclusions, which deteriorates the toughness of the base material and welds, so that the Ca and REM contents are limited to 0.003% or less and 0.01% or less, respectively." (Col.8, lines 32-44 of US'920). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the element Ca of JP'628 with REM as demonstrated by US'920, because substitution of equivalents would be within the expected skill in the art with expected success. See MPEP 2144.06. Because JP'628 in view of US'920 teaches the similar essential elements in the alloy, the alloy of JP'628 in view of US'920 meets the requirement of "consisting of" in the instant claim.

Regarding the equation [1] in the instant claim 1, which is fully depends on the alloy's compositions, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re

Art Unit: 1733

Cooper and Foley 1943 C.D.357, 553 O.G.177; 57 USPQ 117, Taklatwalla v.Marburg. 620 O.G.685, 1949 C.D.77, and In re Pilling, 403 O.G.513, 44 F(2) 878, 1931 C.D.75. In the instant case, in the absence of evidence to the contrary, the selection of the proportions of elements: Ni, Mn, C, Cr, Mo, V, and Cu from JP'628 in view of US'920 in order to meet the claimed equation would appear to require no more than routine investigation by those ordinary skilled in the art. In re Austin, et al., 149 USPQ 685, 688. The Examiner further note that if choosing the sample number 1 from the table 1 of JP'628 for calculation, sample 1 has major composition ranges within or close to the claimed composition ranges, the calculated C_{eq} is about 0.37, the calculated Ni/Mn is about 1.02, and the sample 1 meets the requirement of equation [1]. JP'628 teaches oxygen included particles in the number 100-3,000 pieces/mm² with circle-equivalent particle sizes of 0.005-2 μ m (Abstract of JP'628), which reads on the limitation of at least 100/mm² of oxide particles and overlapping the circle-equivalent diameter range of 0.005 to 0.5 μ m as recited in the instant claim.

Regarding claim 2, JP'628 teaches optional adding less than 0.0050wt%Mg and less than 0.1wt%REM in the alloy (claim 2 of JP'628), which overlapping the one or more of 0.0003-0.0050wt%Mg

Art Unit: 1733

and 0.001-0.030wt%REM as recited in the instant claim. JP'628 teaches oxygen included particles in the number 100-3,000 pieces/mm² with circle-equivalent particle sizes of 0.005-2μm (Abstract of JP'628), which reads on the limitation of at least 100/mm² of oxide particles and overlapping the circle-equivalent diameter range of 0.005 to 0.5μm as recited in the instant claim.

Regarding claims 3 and 4, JP'628 teaches adding 0.0005-0.0070wt%B and optionally adding less than 1.0wt%Cu; less than 0.1wt%V; less than 0.6wt%Cr; and less than 0.6wt%Mo in the alloy (Claim 2 of JP'628), which overlapping the claimed one or more optional elements of 0.0005-0.0050wt%B; 0.1-0.5wt%Cr; 0.01-0.5wt%Mo; 0.005-0.01wt%V; and 0.1-1.0wt%Cu as recited in the instant claims.

Response to Arguments

Applicant's arguments, see the Applicant arguments/remark, filed 11/05/2010, with respect to the rejection(s) of claim(s) 1-4 under 103 (a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found references, which makes this office action non-final.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-270-1884. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jie Yang/
Patent Examiner, Art Unit 1733